



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/761,778	01/18/2001	Yoshinobu Kubota	1460.1016	5961

21171 7590 12/01/2004

STAAS & HALSEY LLP
SUITE 700
1201 NEW YORK AVENUE, N.W.
WASHINGTON, DC 20005

EXAMINER

KAO, CHIH CHENG G

ART UNIT PAPER NUMBER

2882

DATE MAILED: 12/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/761,778

Applicant(s)

KUBOTA ET AL.

Examiner

Chih-Cheng Glen Kao

Art Unit

2882

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 October 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 October 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the mirror and diffraction grating of claims 13 and 14 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 2, 4, 6, 7, 9-12, and 15-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ooi et al. (US Patent 5917628) in view of Kubota et al. (US Patent 5953466).

3. Regarding claims 1 and 17, Ooi et al. discloses a device (Fig. 1) comprising a first optical element (Fig. 1, #62) formed on a substrate (Fig. 1, #68), guiding light, and having an optical coupling part (Fig. 1, component between #62 and 63 or #62 and 64), a second optical element (Fig. 1, #63 or 64) formed on the substrate and guiding light received from the optical coupling part of the first optical element, wherein the optical coupling part physically connects the first and second optical elements (Fig. 1, #62 and 63 or #62 and 64).

However, Ooi et al. does not disclose an optical element formed on a substrate and guiding or protecting light radiated, emitted, or leaking from an optical coupling part.

Kubota et al. teaches an optical element (Fig. 9a, #21) formed on a substrate (Fig. 8a, #1a) and guiding or protecting light radiated, emitted, or leaking (Abstract, lines 5-7) from an optical coupling part (Fig. 9a, #4b).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to incorporate the device of Ooi et al. with the optical element of Kubota et

Art Unit: 2882

al., since one would be motivated to make such a modification to increase the intensity of the emitted optical signal (col. 9, lines 22-26) as implied from Kubota et al.

4. Regarding claim 2, Ooi et al. further discloses at least one optical element as a Mach-Zehnder type optical element (col. 7, lines 34-35).

5. Regarding claim 4, Ooi et al. further discloses at least two optical elements connected in tandem (Fig. 1, #62 and 63).

6. Regarding claim 6, Ooi et al. further discloses a first Mach-Zehnder type optical modulating part for applying a clock (abstract, line 9) signal voltage to an electrode (Fig. 1, #62) for varying a refractive index of an optical coupling part (col. 6, lines 5-7) and a second Mach-Zehnder type optical modulating part for applying a signal voltage modulated according to information to be transmitted to a second electrode (Fig. 1, #70).

7. Regarding claim 7, Ooi et al. further discloses the substrate made of lithium niobate (col. 9, lines 51-52).

8. Regarding claims 9, 10, 18, and 19, Ooi et al. discloses a device (Fig. 1) comprising a substrate (Fig. 1, #68) having at least two optical elements (Fig. 1, #62, 63, or 64), and a first optical waveguide (Fig. 1, waveguide between #62 and 63 or #62 and 64) formed on the

Art Unit: 2882

substrate and physically connecting the optical elements to guide signal light outputted from an upstream optical element (Fig. 1, #62) to a downstream optical element (Fig. 1, #63 or 64).

However, Ooi et al. does not disclose a pair of optical waveguides formed on a substrate and formed on both sides of an optical waveguide to guide light radiated or leaking from the optical waveguide.

Kubota et al. teaches a pair of optical waveguides (Fig. 9a, #21) formed on a substrate (Fig. 8a, #1a) and formed on both sides of an optical waveguide to guide light radiated or leaking from the optical waveguide (Abstract, lines 5-7).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to incorporate the device of Ooi et al. with the optical waveguides of Kubota et al., since one would be motivated to make such a modification to increase the intensity of the emitted optical signal (col. 9, lines 22-26) as implied from Kubota et al.

9. Regarding claims 11, 15, and 16, Ooi et al. as modified above suggests a device and method as recited above.

However, Ooi et al. does not disclose an optical element guiding light, which is radiated or leaking from the optical coupling part, to an outside of a substrate.

Kubota et al. teaches an optical element guiding light, which is radiated or leaking from the optical coupling part, to an outside of a substrate (Fig. 9a, #21).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to further incorporate the device and method of Ooi et al. as modified above with the optical element of Kubota et al., since one would be motivated to make such a

Art Unit: 2882

modification to increase the intensity of the emitted optical signal (col. 9, lines 22-26) as implied from Kubota et al.

10. Regarding claim 12, Ooi et al. as modified above suggests a device and method as recited above.

However, Ooi et al. does not disclose an optical element extending to an end of an outside face of a substrate, to at least one of an upper and lower surface of the substrate, and releasing light which is radiated or leaking from an optical coupling part to an exterior at the surface to which the optical element extends.

Kubota et al. an optical element extending to an end of an outside face of a substrate, to at least one of an upper and lower surface of the substrate, and releasing light which is radiated or leaking from an optical coupling part to an exterior at the surface to which the optical element extends (Figs. 8a and 9a, #21).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to further incorporate the device and method of Ooi et al. as modified above with the optical element of Kubota et al., since one would be motivated to make such a modification to increase the intensity of the emitted optical signal (col. 9, lines 22-26) as implied from Kubota et al.

11. Claims 1-4 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Inoue et al. (US Patent 5117470) in view of Kubota et al.

12. Regarding claim 1, Inoue et al. discloses a device comprising a first optical element (Fig. 32, #70a) on a substrate (Fig. 32, #9) having an optical coupling part (Fig. 32, optical coupling part between #70a and #70c) and a second optical element (Fig. 32, #70c) on the substrate guiding light from the first optical element, wherein the optical coupling part physically connects the first and second optical elements (Fig. 32).

However, Inoue et al. does not disclose an optical element formed on a substrate guiding or protecting light radiated from an optical coupling part.

Kubota et al. teaches an optical element (Fig. 9a, #21) formed on a substrate (Fig. 8a, #1a) and guiding or protecting light radiated (Abstract, lines 5-7) from an optical coupling part (Fig. 9a, #4b).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to incorporate the device of Inoue et al. with the optical element of Kubota et al., since one would be motivated to make such a modification to increase the intensity of the emitted optical signal (col. 9, lines 22-26) as implied from Kubota et al.

13. Regarding claim 2, Inoue et al. further discloses at least one optical element as a Mach-Zehnder type optical element (Fig. 32, #70a).

14. Regarding claim 3, Inoue et al. further discloses at least one optical element as a Mach-Zehnder interferometer type optical modulator (Fig. 32, #70a).

Art Unit: 2882

15. Regarding claim 4, Inoue et al. further discloses at least two optical elements connected in tandem (Fig. 32, #70a and 70c).

16. Regarding claim 8, Inoue et al. further discloses light from the first optical element formed in a Mach-Zehnder interferometer structure to attenuate light intensity and vary an amount of attenuation (Fig. 32, #70c).

17. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ooi et al. in view of Kubota et al. as applied to claim 1 above, and further in view of Asano et al. (US Patent 5621839).

Ooi et al. as modified above suggests a device as recited above.

However, Ooi et al. does not disclose a ferroelectric substrate.

Asano et al. teaches a ferroelectric substrate (Title).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to incorporate the device of Ooi et al. as modified above with the ferroelectric substrate of Asano et al., since one would be motivated to make such a modification to reduce light insertion loss and provide better signal control (col. 2, lines 1-16) as implied from Asano et al.

18. Claims 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ooi et al. in view of Kubota et al. as applied to claim 12 above, and further in view of Jestel et al. (US Patent 5396328).

Art Unit: 2882

Ooi et al. as modified above suggests a device as recited above.

However, Ooi et al. does not disclose mirrors or a diffraction grating at the end.

Jestel et al. teaches mirrors (Fig. 1, #15-17) or a diffraction grating (col. 7, lines 4-12, and Fig. 6, #55) at the end.

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to incorporate the device of Ooi et al. as modified above with the mirrors or diffraction gratings of Jestel et al., since one would be motivated to make such a modification for better guiding light to a different location (col. 1, lines 10-20) as implied from Jestel et al.

Response to Arguments

19. Objections to the claims in the Office Action mailed 7/27/04 have been withdrawn in light of the Amendment filed 10/27/04.

20. Applicant's arguments with respect to claims 1-19 have been considered but are moot in view of the new ground(s) of rejection.

21. Applicant's arguments filed 10/27/2004 have been fully considered but they are not persuasive.

Regarding Inoue et al., Inoue et al. still applies as prior art. The optical elements that the Examiner now refers to are #70a and 70c of Figure 32. See paragraph 12 above. As seen in Figure 32, the two optical elements (#70a and 70c) are physically connected by an optical coupling part (optical waveguide between #70a and 70c).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chih-Cheng Glen Kao whose telephone number is (571) 272-2492. The examiner can normally be reached on M - F (9 am to 5 pm).


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on (571) 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2882

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



gk



EDWARD J. GLICK
SUPERVISORY PATENT EXAMINER